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EFFECT OF EDUCATION ON PATIENT COLONOSCOPY COMPLIANCE: LITERATURE REVIEW

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ABSTRACT
Bowel preparation is essential to ensure optimal visualization during colonoscopy, thus facilitating a safe procedure and ensuring comprehensive data acquisition. An important aspect of patient preparation is education, which is critical to ensure optimal outcomes and patient compliance.The purpose of this study is to analyze the effect of education on patient compliance in performing colonoscopy examination preparation in the endoscopy unit. The research method employed was a comprehensive literature review on patient compliance with colonoscopy preparation. A comprehensive search strategy was employed, encompassing three prominent web databases: Google Scholar, Proquest, and Gale. The search was conducted from 2016 to 2024, and the full-text articles were obtained in PDF format for further analysis. The search was conducted using the keywords "colonoscopy" "education" "compliance" and "bowel preparation". The literature selection process employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses method, yielding ten relevant publications. The results of the study indicated a significant positive impact of educational interventions on patient compliance with colonoscopy preparation, as well as a concomitant enhancement in the quality of bowel preparation among individuals undergoing colonoscopy procedures. Nurse practitioners must educate patients to promote optimal outcomes from both the examination itself and the subsequent colonoscopy procedure.

Keywords: compliance; colonoscopy; education; preparation

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INTRODUCTION

Colonoscopy is a widely used method for the diagnosis and treatment of gastrointestinal diseases (Latos et al., 2022). It is regarded as the gold standard in the diagnosis of diseases prior to any further therapeutic intervention in the lower gastrointestinal tract (Janahiraman et al., 2020). The colonoscopy instrument is employed to meticulously examine the entire mucosa of the colon and to evaluate its condition (Massinha et al., 2018). The colonoscopy examination is performed for a variety of indications, including, but not limited to, bloody bowel movements, chronic diarrhea, anemia, abdominal pain, tumor screening, and polyp detection (Baker et al., 2019).In preparation for a colonoscopy, adequate colon hygiene is paramount. This involves a series of measures, including the consumption of a restricted diet devoid of fiber foods for 2-3 days preceding the procedure, the use of laxatives, and the observance of a fast. As asserted by Saltzman et al., 2015 in (Zhao et al., 2019). The quality of bowel hygiene can be assessed by performing a bowel preparation evaluation. The evaluation of bowel hygiene is typically based on the presence or absence of specific forms of fecal matter, such as clear fluid, cloudy fluid, semi-solid, solid, or a combination thereof. The outcomes of this evaluation are then categorized as either adequate preparation or inadequate preparation (Gardezi & Tibbatts, 2017). Ensuring optimal bowel preparation is paramount for colonoscopy procedures, as it facilitates enhanced visualization, safety, and efficacy. Poor bowel preparation can hinder diagnostic accuracy and lead to repeated procedures, resulting in increased patient costs (Janahiraman et al., 2020).

A significant factor contributing to effective bowel preparation is the collaboration between healthcare providers and patients. In this context, nurses play a pivotal role in educating patients on the significance of adequate bowel preparation, ensuring their compliance with the established instructions. This education should encompass dietary restrictions during bowel preparation, emphasizing a soft diet devoid of fiber, and the proper manner and timing of laxative intake. A comprehensive strategy is imperative to optimize bowel preparation (Arslanca & Aygün, 2022). Another viewpoint, as articulated by Janahiraman et al., (2020), asserts the necessity for education to encompass not only the significance of a soft diet devoid of fiber prior to examination, but also the importance of adequate hydration during laxative administration and the optimal timing for its ingestion. Beyond these considerations, it is imperative to underscore the significance of inculcating patients with a profound understanding of the purpose of bowel preparation, emphasizing the anticipated outcomes of a meticulous preparation process. This heightened awareness is instrumental in facilitating the success of the colonoscopy procedure. The findings of research by Gkolfakis et al., (2019) demonstrate a clear correlation between patient knowledge and compliance with the recommended procedures. Despite the implementation of various educational interventions by nurses, the colonoscopy preparation process frequently exhibits deficiencies. In this particular instance, the efficacy of the educational interventions provided by nurses appears to be suboptimal for patients. A subsequent study by Shin et al., (2019) revealed that of the respondents who underwent colonoscopy preparation following education sessions provided by nurses, 389 patients (54.4%) exhibited clean bowel characteristics, 313 patients (43.8%) had residual feces, 13 patients (1.8%) had brown liquid, and 138 patients (19.3%) had dirty bowel.

The degree to which patients adhere to instructions related to bowel preparation procedures may be assessed by examining their compliance with the aforementioned instructions, their utilization of prescribed laxatives for bowel emptying, and their adherence to dietary restrictions, such as refraining from fiber foods (Wonggom et al., 2023). Noncompliance with laxative intake can be attributed to factors such as reluctance to wake up early to take laxatives and concerns about defecating during transportation to the hospital. Additionally, noncompliance in following bowel preparation instructions can stem from a lack of appreciation for the importance of preparation, confusion regarding the pre-colonoscopy diet, or a lack of confidence in adhering to the instructions, potentially resulting in suboptimal bowel preparation (Janahiraman et al., 2020). In accordance with the research conducted by Woo DH et al in (Zhao et al., 2019), it was reported that in Asia, 30% of patients failed to adequately prepare for a colonoscopy. This failure was attributed to patient noncompliance with the prescribed preparation procedures and was associated with the patients' knowledge of these procedures.

A study of the medical records from X hospital from January to December 2024 documented the number of colonoscopy procedures performed on 128 patients. Of these, 30 patients (23.43%) exhibited inadequate preparation, while 98 patients (76.56%) demonstrated adequate preparation. The results of in-depth semi-structured interviews were further analyzed. Six patients were interviewed, with two reporting a reluctance to complete their prescribed medication due to concerns regarding the laxatives. Three individuals acknowledged comprehending the nurse's explanation but cited disinclination to adhere to the medication due to its perceived unpleasant taste. The final participant cited a lack of understanding of the nurse's counsel and a reluctance to seek clarification. Observations conducted at Hospital X revealed that the institution does not currently have learning materials such as brochures and posters designed to educate patients about colonoscopy preparation. The nursing staff provides information on colonoscopy preparation verbally to

patients and families, followed by telephone follow-up when the patient is at home. This finding suggests that one contributing factor to patient noncompliance in undergoing colonoscopies may be the absence of adequate education provided by nursing personnel.

METHOD

The present study employed a systematic review, utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach to identify the impact of education on patient compliance with colonoscopy. A comprehensive literature search was conducted, encompassing articles published in databases including Google Scholar, Google Scholar, Proquest, and Gale. Key words included colonoscopy, education, compliance, and bowel. The identified articles, published between 2016 and 2024, were obtained in their entirety in PDF format, translated into both Indonesian and English languages, and made available in two versions.The analysis of the data was conducted through a comparative literature review and presented in a discussion.The methodological approach employed included the following: (1) similarity search, (2) contrast search, (3) critique, (4) compare, and (5) summarize. As illustrated in the below flow chart, a comprehensive analysis of ten selected articles reveals a consistent finding: the education provided by nurses significantly impacts patient compliance with colonoscopy preparation, thereby enhancing the efficacy of bowel preparation. The initial database search, employing the relevant keywords, yielded 26,790 articles from online database. Of these, 950 articles were identified as relevant. Subsequent to a thorough evaluation of the titles and abstracts, the number was reduced to 96 articles. A full-text reassessment was then conducted on the 96 articles, resulting in the identification of 10 articles that met the inclusion criteria for this study.

RESULT

Table 1.
Literature Review Results

Author (Year)	Article Title	Purpose	Research Methods	Results
Gwag & Yoo (2024). Healthcare; Basel Vol. 12, Iss. 14	Development and Effectiveness Evaluation of 360-Degree Virtual Reality-Based Educational Intervention for Adult Patients Undergoing Colonoscopy	This study evaluated the impact of an immersive 360◦ virtual reality (VR)-based educational intervention for first-time adult colonoscopy patients regarding anxiety, attitudes, knowledge, compliance with bowel preparation, and bowel cleanliness.	A quasi-experimental design with a non-equivalent control group and non-synchronized pretest–post-test clinical trial was conducted with 40 patients in the experimental group and 40 in the control group. The 360◦ VR intervention included two sessions: precautions before colonoscopy and the colonoscopy process. The control group received education through individual verbal explanations with written materials.	The findings indicated that the VR intervention significantly improved patients' colonoscopy-related anxiety, attitudes, adherence to bowel preparation instructions, and bowel cleanliness. Utilizing 360◦ VR as an educational tool has the potential to enhance the effectiveness of educational programs by providing realistic information and engaging patients. These findings suggest that 360◦ VR has the capacity to enhance screening rates and clinical outcomes by reducing negative perceptions associated with colonoscopy.
Zhao et al., (2019). BMJ Open; London Vol. 9, Iss. 8	Educational virtual reality videos in improving bowel preparation quality and satisfaction of	This study aims to explore whether VR videos can improve bowel preparation quality, increase	The trial is a prospective, randomised, single-blinded, single-centre trial. Outpatients who are scheduled to undergo	Virtual video education has been demonstrated to enhance patient compliance, resulting in superior quality outcomes (97.5%) when compared to conventional patient education

Author (Year)	Article Title	Purpose	Research Methods	Results
	outpatients undergoing colonoscopy: protocol of a randomised controlled trial	patient adherence and satisfaction, and reduce pre-procedure anxiety, compared with conventional patient education methods.	colonoscopy for screening or diagnostic purposes for the first time will be randomised to receive either the conventional patient education or the conventional methods plus VR videos, and 322 patients will be enrolled from the Peking Union Medical College Hospital.	methods (77.5%).
Rusiana (2024). Jurnal Kesehatan STIKes Banten RI Volume 9, No. 1 – January	Relationship between the Implementation of Endoscopy Preparation Education Patient Compliance with Endoscopy Preparation at Mandaya Royal Puri Hospital	This study aims to examine the correlation between the implementation of education regarding endoscope preparation and patient compliance with endoscope preparation.	Quantitative research with a descriptive design using a cross sectional approach.	There is a relationship between the implementation of education and patient compliance with the preparation with a p value of 0.007 (α <0.05).
Malidia et al., (2019). Jurnal Kesehatan, Vol. 8 No. 1	Effect of Endoscopic Preparation Education on Patient Compliance with Endoscopic Preparation	The objective of this study was to ascertain the impact of educational initiatives concerning endoscopy preparation on the implementation of endoscopy preparation protocols at Tangerang Regency General Hospital.	This study utilized an experimental equation design with a post test research design and nonequivalent control group designs. The population of 20 people was selected using an accidental sampling technique, with the first 10 people designated as the intervention group and the second 10 people as the control group.	The findings of this study demonstrate a statistically significant relationship between the educational interventions provided to patients and their adherence to endoscopy preparation protocols at Tangerang Regency Hospital, with a p-value less than 0.05.
Zhang et al., (2018). Chinese Medical Journal (Vol. 131, Issue 14)	Effect of Education by Messaging Software on the Quality of Bowel Preparation for Colonoscopy	The objective of this study was to make a comparison between the standard of bowel preparation for colonoscopy in patients who had received	This prospective, endoscopist-blinded, randomized controlled study was conducted in the No. 1 Hospital of Yangtze University. Between June 2015 and May 2016, patients aged 18–75 years who were scheduled for	The intervention group, which utilized an educational platform through a chat service, exhibited a higher rate of patient compliance with colonoscopy preparation (90.2%) compared to the control group (88.2%).

Author (Year)	Article Title	Purpose	Research Methods	Results
		standard education and in those who had used the WeChat public number for bowel preparation education.	outpatient screening colonoscopy were enrolled. All enrolled patients were randomly assigned to either the WeChat group or control group.	
Liu et al., (2020). Medicine 99.36 : e20976.	Ward nurses-focused educational intervention improves the quality of bowel preparation in inpatients undergoing colonoscopy	To investigate whether enhanced education of ward nurses could improve the bowel preparation quality in inpatients undergoing colonoscopy.	This was a single-center randomized controlled study. A total of 190 consecutive inpatients scheduled to undergo colonoscopy from March 2019 to March 2020 were randomized to the educated (nurses with enhanced education) or control group (nurses without enhanced education). We assessed the bowel preparation quality using the Boston bowel preparation scale.	There were 89 patients in the educated group and 101 patients in the control group. The proportion of colonoscopies with adequate bowel preparation was 83.1% in the educated group and 69.3% in the control group. Patients' compliance with bowel preparation in the educated group was superior to that in the control group. Furthermore, significantly better sleep quality was found in the educated group. The multivariate logistic regression analysis identified the ward nurses-focused enhanced educational intervention as a risk factor for bowel preparation quality.
Bashkin et al., (2024). European Journal of Investigation in Health, Psychology and Education, 14(6), 1688-1699.	A Patient-Centered Approach to Communication during Endoscopic Procedures: The Importance of Providing Information to Patients	The purpose of the study was to explore patients' experiences and perceptions during the various stages of endoscopic procedures. The study also examined the relationship between patient-centered communication and patient experience. .	Quantitative research with cross-sectional descriptive design.. A total of 191 patients responded to pre- and post-procedure surveys that inquired about fear and pain, patients' satisfaction regarding the information provided to them, perceptions and experience.	Pain was associated with post-procedure fear ($r = 0.63$, $p < 0.01$) and negatively associated with reported patient experience at the end of the visit ($r = -0.17$, $p < 0.01$). Significant positive associations were found between patient experience and satisfaction from the information provided before ($r = 0.47$, $p < 0.01$) and the information provided after the procedure ($r = 0.51$, $p < 0.001$). A predictive model found that perceptions toward the physicians, satisfaction from information provided before discharge, and feelings of trust are predictors of the patient experience ($F = 44.9$, $R2 = 0.61$, $p < 0.001$). Patients' satisfaction with information provided before and after the procedure can positively affect the patients' experience, leading to a decrease in fear and anxiety and increasing compliance with medical recommendations.

Author (Year)	Article Title	Purpose	Research Methods	Results
Chen et al., (2024). In Healthcare (Vol. 12, No. 14, p. 1374). MDPI.	Effectiveness of a Mobile Health Application for Educating Outpatients about Bowel Preparation.	This study aims to evaluate the effectiveness of a mobile healthcare model using a mobile application for bowel preparation education in colonoscopy.	Quantitative research approach, using a single-blind, randomized, quasi-experimental design with a post-test-only, equivalent-group design. In the single-blind study design, the endoscopists performing the colonoscopy do not know whether the study subjects are from the experimental group or the control group.	The mobile application effectively assisted individuals in completing bowel preparation tasks. Specifically, 75% of users received an "excellent" rating, which showed statistical significance (p = 0.016).Push notifications reminded users of diet, medication, and appointment times, improving bowel preparation accuracy and compliance.
Park et al., (2016). BMC gastroenterology, 16, 1-8.	A randomized controlled trial of an educational video to improve quality of bowel preparation for colonoscopy.	The objective of this study was to assess the impact of a brief video on the efficacy of bowel preparation for colonoscopy and its correlation with pertinent clinical outcomes, including polyp detection.	A randomized and prospective study was conducted. During the pre-colonoscopy visit, patients were provided with standard instruction on bowel prep. Subjects scheduled to undergo a colonoscopy were randomly assigned to view an educational video (video group) on the day before the procedure or to a non-video group (control group). The quality of bowel preparation was then compared between the two groups using the Ottawa Bowel Preparation Quality scale, also known as the Ottawa score. In addition, the study investigated factors associated with inadequate bowel preparation.	A total of 502 patients were randomized into two groups: a video group and a non-video group. The randomization process resulted in 250 patients being assigned to the video group and 252 to the non-video group. The video group demonstrated superior bowel preparation, as evidenced by a mean Ottawa total score of 3.03 ± 1.9, in comparison to the non-video group's score of 4.21 ± 1.9 (P < 0.001). Additionally, the video group exhibited optimal bowel preparation for colonoscopy, with a total Ottawa score of less than 6 in 91.6% of cases, as opposed to 78.5% in the non-video group (P < 0.001). Multivariate analysis revealed that males (odds ratio [OR] = 1.95, P = 0.029), patients with diabetes mellitus (OR = 2.79, P = 0.021), and non-use of visual aids (OR = 3.09, P < 0.001) were associated with poor bowel preparation. A subsequent comparison of the colonoscopic outcomes between groups revealed no significant disparity in the polyp detection rate between the video and non-video groups (48/250, 19.2% vs. 48/252, 19.0%; P = 0.963). However, the insertion time was found to be significantly shorter in the video group (5.5 ± 3.2 min) compared to the non-video

Author (Year)	Article Title	Purpose	Research Methods	Results
				group (6.1 ± 3.7 min; P = 0.043).
Chen, G et al., (2021). JAMA network open, 4(11), e2135576-e2135576.	Educating outpatients for bowel preparation before colonoscopy using conventional methods vs virtual reality videos plus conventional methods	To investigate whether using VR videos for patient education before colonoscopy could improve bowel preparation.	A prospective, single-blinded, randomized clinical trial of 346 patients undergoing colonoscopy with local anesthesia in a tertiary care hospital was conducted between October 1, 2018, and November 1, 2020. Outpatients who had indications for colonoscopy and had not received one before were enrolled.	A total of 346 outpatients were enrolled in the trial, with 173 patients randomly assigned to each group (control group: 87 women [50.3%]; mean [SD] age, 50.5 [12.5] years; VR video group: 84 women [48.6%]; mean [SD] age, 52.6 [11.4] years). Baseline characteristics, including demographic information, medical history, lifestyle, and the characteristics of stool, were comparable between the VR video group and the control group. The mean (SD) Boston Bowel Preparation Scale score was significantly higher in the VR video group than in the control group (7.61 [1.65] vs 7.04 [1.70]; P = .002). The VR group exhibited a higher detection rate of polyps (72 of 172 [41.9%] vs. 46 of 172 [26.7%]; P = .003) and adenomas (56 of 172 [32.6%] vs. 38 of 172 [22.1%]; P = .03) compared to the control group. Patients who received VR education exhibited higher levels of compliance (119 [68.8%] vs. 87 [50.3%]; P < .001) and greater mean (SD) overall satisfaction (8.68 [1.70] vs. 8.16 [2.15]; P = .01) with bowel preparation. Patients who received VR video education before colonoscopy had better bowel preparation, higher polyp and adenoma detection rates, and improved compliance and satisfaction.

A total of ten articles were subjected to analysis, revealing eight articles that exhibited similarities, namely research conducted in the form of quasi-experimental studies involving two distinct groups (seven articles) and one intervention article addressing random respondents. Research conducted by Gwag & Yoo (2024) on 80 respondents, who were divided into 40 respondents in the intervention group, namely education in the form of videos, with the results showing that education in the form of virtual videos significantly improved attitudes and compliance with bowel preparation instructions. Another study, Zhang et al., (2018), conducted a prospective trial on 542 intervention groups using an educational platform through chat services, with the results of the study increasing compliance by 90.2% in the intervention group. Another intervention, in the form of intensive educational programs, was studied by Liu et al., (2020) in 89 intervention groups. The result of this study indicated that patient compliance with bowel preparation increased (89.1%). A similar finding

was reported by Chen et al., (2024), who conducted a prospective trial on 40 intervention groups using an application. The application effectively improved the accuracy and compliance of bowel preparation, with patients achieving excellent ratings (75%) in completing bowel preparation tasks. Another study with a similar design was conducted by Park et al., (2016) with an intervention group of 250 respondents who received additional education via videos. The results of this study indicated that increased compliance with bowel preparation was achieved due to the accessibility of the educational materials via the internet at any time. A subsequent study by Chen et al., (2021) utilized a Video Reality (VR) educational intervention and surveyed 119 respondents in the VR group. The findings indicated a higher level of compliance among the VR group compared to the control group, with 119 respondents (68.8%) demonstrating compliance compared to 87 respondents (50.3%) in the control group. This statistical difference was statistically significant ($P < 0.001$). Another study by Zhao et al., (2019) randomly assigned 322 respondents to either the intervention or control group and found that virtual video education increased patient compliance and produced favorable results (97.5%). Another article by Malidia et al., (2019) provided intervention education to 10 individuals in the intervention group and found that the education had a significant impact on patient compliance in undergoing endoscopy preparation at Tangerang Regency Hospital, with a p value of less than 0.005.

A comprehensive search strategy was employed to identify relevant articles, with a particular focus on research employing quantitative methods, descriptive designs, and a cross-sectional approach. One of the articles, Rusiana (2024), conducted research on 40 respondents, finding a relationship between the implementation of education on patient compliance with preparation with a p value of $0.007 < \alpha$ (0.05). Another study by Bashkin et al., (2024) employed a cross-sectional quantitative design, surveying 191 respondents. The findings indicated that patient satisfaction with information provided before and after procedures can positively influence the patient experience, reducing fear and anxiety related to procedures and enhancing compliance with medical recommendations concerning endoscopic procedures.

DISCUSSION

Colonoscopy is a frequently performed endoscopic examination procedure. It is used most commonly to screen and surveil colon disorders, including colorectal tumors. It is a particularly important procedure for patients with various gastrointestinal disease conditions (Kothari et al., 2019). Enhanced patient compliance with bowel preparation can be accomplished via effective education, thereby mitigating risks associated with inadequate preparation, including rescheduling of colonoscopies and failure to identify intestinal wall abnormalities. The efficacy of bowel preparation is contingent on patient compliance, and the quality of this preparation is influenced by the education provided by nurses. The employment of multimedia resources, such as videos, brochures, and posters, is recommended to facilitate comprehension of colonoscopy preparation instructions. The use of electronic media, such as chat and video conferencing, facilitates the monitoring and observation of bowel preparation implementation in the home environment. This approach aligns with the findings of a prospective trial conducted by Zhang et al., (2018), which involved 542 intervention groups utilizing an educational platform through chat services. The study's results demonstrated a 90.2% increase in compliance among the intervention group. Another type of media that can be used as an option is educational video media, which can be used by nurses to deliver education to patients so that patients can see and understand the contents of the education in the video, thereby improving compliance and the quality of good preparation results. This assertion is further substantiated by the findings of a study conducted by Zhao et al., (2019), who implemented a randomized virtual video intervention study among 322 respondents. The study's results indicated that the virtual video education intervention significantly enhanced

patient compliance, with a compliance rate of 97.5%, thereby underscoring the efficacy of this educational modality.

Adequate bowel preparation is essential for the detection of pathological lesions during colonoscopy Hassan et al., (2019). Nurses have an important role in supporting bowel preparation by providing education; however, it is often found that nurses do not understand the education related to bowel preparation that is delivered. In light of this finding, there is an evident need for educational interventions to be developed and implemented. These educational interventions should target nurses to ensure optimal patient education, thereby maximizing the efficacy of bowel preparation procedures and achieving the desired outcomes. Research that supports this is the results of research (Yuan-Lung Cheng, Kuang-Wei Huang, Wei-Chih Liao, Jiing-Chyuan Luo, Keng-Hsin Lan, Chien-Wei Su, Yuan-Jen Wang, 2018), namely educational interventions that focus on health staff, such as doctors and nurses, can improve patient understanding of bowel preparation instructions, and consequently, improve the quality of bowel preparation. Another study that lends support to this claim is that of Arslanca & Aygün, (2022), which found that educating nurses can yield positive outcomes for patients. Nurses who possess a comprehensive understanding of the preparation process for colonoscopies can effectively communicate with patients, enhancing their compliance with the recommended guidelines. Another study that lends support to this claim is the research by Cai et al., (2022). The findings indicate that the provision of education to nurses is associated with positive outcomes for patients. Nurses who possess knowledge regarding the preparation process for effective actions are better equipped to provide patients with clear explanations regarding colonoscopy preparation. This, in turn, can lead to an increase in patient compliance with the recommendations provided.

The efficacy of adequate bowel preparation is influenced by various factors, including the patient's medical history, particularly the presence of diabetes mellitus. This finding aligns with the research by Zad et al., (2020) that demonstrates an association between a history of diabetes mellitus and suboptimal bowel preparation, characterized by a prolonged duration of action time. This underscores the necessity for enhanced patient education and engagement to optimize outcomes.Diabetes mellitus has been observed to impact gastrointestinal motility, including colon transit. This condition is known as diabetic gastroparesis, which is characterized by decreased bowel movement and inadequate bowel preparation, resulting in a greater residue in the bowel during colonoscopy and a prolonged procedure time (Shahini et al., 2023). The ability of diabetic patients to adhere to rigorous bowel preparation protocols may be hindered by two main factors. Firstly, diabetic complications, such as neuropathy, which impairs an individual's capacity to comprehend and execute instructions, can hinder compliance. Secondly, the side effects of diabetic medications targeting the digestive system can also impede adherence to these protocols (Saltzman et al., 2015).

Another factor that greatly influences the implementation of bowel preparation is the patient's feelings about undergoing a colonoscopy. Some patients experience anxiety before a colonoscopy due to various triggers, such as their first experience with the procedure, concerns about the results, and the follow-up of the examination results.In such cases, it appears crucial to provide education using media that can be easily understood to reduce patient anxiety. For instance, the use of video media can facilitate patient education through audio-visual means. This assertion is corroborated by the findings of Mustofa et al., (2023), which demonstrate that the intervention group that received education through smartphone visual videos exhibited a substantial reduction in anxiety ($p=0.000$), systolic blood pressure (0.042), and diastolic blood pressure ($p=0.008$). Consequently, the utilization of smartphone

visual video media for self-care education emerges as a promising alternative, given its demonstrated efficacy in reducing anxiety.

CONCLUSION

Nurse education has been shown to have a significant positive impact on patient compliance during bowel preparation procedures. This, in turn, has been demonstrated to result in enhanced quality of preparation outcomes. It is therefore essential that patients adhere strictly to all preprocedure instructions, including the consumption of prescribed laxatives for bowel emptying and the observance of any applicable dietary restrictions. The enhancement of bowel preparation quality has been demonstrated to result in a reduction in the duration of procedures requiring the insertion and removal of scopes when compared to patients who have not undergone optimal bowel preparation. This, in turn, has the effect of decreasing the necessity for prolonged use of anesthetic drugs. Consequently, it can be concluded that education has a significant influence on patient compliance, thereby ensuring optimal outcomes in terms of quality bowel preparation.

REFERENCES

Arslanca, G., & Aygün, M. (2022). Effect of nurse-performed enhanced patient education on colonoscopbowel preparation quality*. Revista Latino-Americana de Enfermagem, 30. https://doi.org/10.1590/1518-8345.5597.3627

Baker, F. A., Mari, A., Hosadurg, D., Suki, M., Ovadia, B., Gal, O., & Kopelamn, Y. (2019). The impact of colonoscopy indication on polyp detection rate. Annals of Gastroenterology, 32(3), 278–282. https://doi.org/10.20524/aog.2019.0374

Bashkin, O., Boltean, R., Ben-Lulu, R., Aharon, M., Elhayany, R., Yitzhak, A., Guterman, R., & Abu-Freha, N. (2024). A Patient-Centered Approach to Communication during Endoscopic Procedures: The Importance of Providing Information to Patients. European Journal of Investigation in Health, Psychology and Education, 14(6), 1688–1699. https://doi.org/10.3390/ejihpe14060111

Cai, W., Zhang, X., Luo, Y., Ye, M., Guo, Y., & Ruan, W. (2022). Quality indicators of colonoscopy care: a qualitative study from the perspectives of colonoscopy participants and nurses. BMC Health Services Research, 22(1). https://doi.org/10.1186/s12913-022-08466-5

Chen, G., Zhao, Y., Xie, F., Shi, W., Yang, Y., Yang, A., & Wu, D. (2021). Educating Outpatients for Bowel Preparation Before Colonoscopy Using Conventional Methods vs Virtual Reality Videos Plus Conventional Methods. JAMA Network Open, 4(11), E2135576. https://doi.org/10.1001/jamanetworkopen.2021.35576

Chen, H. Y., Tu, M. H., & Chen, M. Y. (2024). Effectiveness of a Mobile Health Application for Educating Outpatients about Bowel Preparation. Healthcare (Switzerland), 12(14). https://doi.org/10.3390/healthcare12141374

Gardezi, S. A., & Tibbatts, C. (2017). Improving bowel preparation for colonoscopy in a cost effective manner. BMJ Quality Improvement Reports, 6(1), u204560.w5376. https://doi.org/10.1136/bmjquality.u204560.w5376

Gkolfakis, P., Tziatzios, G., Papanikolaou, I. S., & Triantafyllou, K. (2019). Strategies to improve inpatients' quality of bowel preparation for colonoscopy: A systematic review and meta-analysis. In Gastroenterology Research and Practice (Vol. 2019). Hindawi Limited. https://doi.org/10.1155/2019/5147208

Gwag, M., & Yoo, J. (2024). Development and Effectiveness Evaluation of 360-Degree Virtual Reality-Based Educational Intervention for Adult Patients Undergoing Colonoscopy. Healthcare (Switzerland), 12(14). https://doi.org/10.3390/healthcare12141448

Hassan, C., East, J., Radaelli, F., Spada, C., Benamouzig, R., Bisschops, R., Bretthauer, M.,

Dekker, E., Dinis-Ribeiro, M., Ferlitsch, M., Fuccio, L., Awadie, H., Gralnek, I., Jover, R., Kaminski, M. F., Pellisé, M., Triantafyllou, K., Vanella, G., Mangas-Sanjuan, C., … Dumonceau, J. M. (2019). Bowel preparation for colonoscopy: European society of gastrointestinal endoscopy (esge) guideline-update 2019. Endoscopy, 51(8), 775–794. https://doi.org/10.1055/a-0959-0505

Janahiraman, S., Tay, C. Y., Lee, J. M., Lim, W. L., Khiew, C. H., Ishak, I., Onn, Z. Y., Ibrahim, M. R., & Chew, C. K. (2020). Effect of an intensive patient educational programme on the quality of bowel preparation for colonoscopy: A single-blind randomised controlled trial. BMJ Open Gastroenterology, 7(1). https://doi.org/10.1136/bmjgast-2020-000376

Kothari, S. T., Huang, R. J., Shaukat, A., Agrawal, D., Buxbaum, J. L., Abbas Fehmi, S. M., Fishman, D. S., Gurudu, S. R., Khashab, M. A., Jamil, L. H., Jue, T. L., Law, J. K., Lee, J. K., Naveed, M., Qumseya, B. J., Sawhney, M. S., Thosani, N., Yang, J., DeWitt, J. M., & Wani, S. (2019). ASGE review of adverse events in colonoscopy. Gastrointestinal Endoscopy, 90(6), 863-876.e33. https://doi.org/10.1016/j.gie.2019.07.033

Latos, W., Aebisher, D., Latos, M., Krupka-Olek, M., Dynarowicz, K., Chodurek, E., Cieślar, G., & Kawczyk-Krupka, A. (2022). Colonoscopy: Preparation and Potential Complications. Diagnostics, 12(3). https://doi.org/10.3390/diagnostics12030747

Liu, A., Yan, S., Wang, H., Lin, Y., Wu, J., Fu, L., Wu, Q., Lu, Y., Liu, Y., & Chen, H. (2020). Ward nurses-focused educational intervention improves the quality of bowel preparation in inpatients undergoing colonoscopy: A CONSORT-compliant randomized controlled trial. Medicine (United States), 99(36), E20976. https://doi.org/10.1097/MD.0000000000020976

Malidia, Z., Susilowati, Y., & Nurhasanah, S. (2019). Pengaruh Edukasi Persiapan Endoskopi Terhadap Kepatuhan Pasien Melaksanakan Persiapan Endoskopi. Jurnal Kesehatan, 8(1), 87–99. https://doi.org/10.37048/kesehatan.v8i1.155

Massinha, P., Almeida, N., Cunha, I., & Tomé, L. (2018). Clinical Practice Impact of the Boston Bowel Preparation Scale in a European Country. GE Portuguese Journal of Gastroenterology, 25(5), 230–235. https://doi.org/10.1159/000485567

Mustofa, S., Sriyono, S., & Veterini, A. S. (2023). Kontrol Edukasi Video Visual Smartphone Berbasis Selfcare terhadap Kecemasan dan Tekanan Darah Pasien Endoskopi dengan Pelayanan Anestesiologi. Journal of Telenursing (JOTING), 5(1), 190–200. https://doi.org/10.31539/joting.v5i1.4887

Park, J. S., Kim, M. S., Kim, H. K., Kim, S. Il, Shin, C. H., Lee, H. J., Lee, W. S., & Moon, S. (2016). A randomized controlled trial of an educational video to improve quality of bowel preparation for colonoscopy. BMC Gastroenterology, 16(1). https://doi.org/10.1186/s12876-016-0476-6

Rusiana, D. (2024). Hubungan Pelaksanaan Edukasi Persiapan Endoskopi Terhadap Kepatuhan Pasien Melaksanakan Persiapan Endoskopi Di Rs Mandaya Royal Puri. Jurnal Kesehatan STIKes Banten RI, 9(1), 50–70.

Saltzman, J. R., Cash, B. D., Pasha, S. F., Early, D. S., Raman Muthusamy, V., Khashab, M. A., Chathadi, K. V., Fanelli, R. D., Chandrasekhara, V., Lightdale, J. R., Fonkalsrud, L., Shergill, A. K., Hwang, J. H., Decker, G. A., Jue, T. L., Sharaf, R., Fisher, D. A., Evans, J. A., Foley, K., … Acosta, R. D. (2015). Bowel preparation before colonoscopy. Gastrointestinal Endoscopy, 81(4), 781–794. https://doi.org/10.1016/j.gie.2014.09.048

Shahini, E., Sinagra, E., Vitello, A., Ranaldo, R., Contaldo, A., Facciorusso, A., & Maida, M. (2023). Factors affecting the quality of bowel preparation for colonoscopy in hard-to-prepare patients: Evidence from the literature. In World Journal of Gastroenterology (Vol. 29, Issue 11, pp. 1685–1707). Baishideng Publishing Group Inc. https://doi.org/10.3748/wjg.v29.i11.1685

Shin, S. Y., Ga, K. S., Kim, I. Y., Park, Y. M., Jung, D. H., Kim, J. H., Youn, Y. H., Park, H.,

& Park, J. J. (2019). Predictive factors for inadequate bowel preparation using low-volume polyethylene glycol (PEG) plus ascorbic acid for an outpatient colonoscopy. Scientific Reports, 9(1). https://doi.org/10.1038/s41598-019-56107-5

Wonggom, P., Rattanakanokchai, S., & Suebkinorn, O. (2023). Effectiveness of bowel preparation innovative technology instructions (BPITIs) on clinical outcomes among patients undergoing colonoscopy: a systematic review and meta-analysis. Scientific Reports, 13(1). https://doi.org/10.1038/s41598-023-37044-w

Yuan-Lung Cheng, Kuang-Wei Huang, Wei-Chih Liao, Jiing-Chyuan Luo, Keng-Hsin Lan, Chien-Wei Su, Yuan-Jen Wang, M.-C. H. (2018). Same-day Versus Split-dose Bowel Preparation Before Colonoscopy: A Meta-analysis. Journal of Clinical Gastroenterology, 52(5), 392–400.

Zad, M., Do, C. N., Heffernan, A., Johnston, L., & Al-Ansari, M. (2020). Factors affecting bowel preparation adequacy and procedural time. JGH Open, 4(2), 206–214. https://doi.org/10.1002/jgh3.12241

Zhang, Q. X., Li, J., Li, Y., Lei, C. H., Shang, B. X., Guan, X. S., & Zhang, Q. (2018). Effect of education by messaging software on the quality of bowel preparation for colonoscopy. In Chinese Medical Journal (Vol. 131, Issue 14, pp. 1750–1752). Wolters Kluwer Medknow Publications. https://doi.org/10.4103/0366-6999.235881

Zhao, Y., Xie, F., Bai, X., Yang, A., & Wu, D. (2019). Educational virtual reality videos in improving bowel preparation quality and satisfaction of outpatients undergoing colonoscopy: Protocol of a randomised controlled trial. BMJ Open, 9(8). https://doi.org/10.1136/bmjopen-2019-029483